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[redacted] 25X1

CONTENTS

12 FEBRUARY 1985

[redacted] 25X1

[redacted] 25X1

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Science and Weapons Daily Review

USSR: FIRST PROFILE VIEW OF FULCRUM A FIGHTER AIRCRAFT [redacted] 25X1

The first photography showing a profile view of the Soviet MiG-29 Fulcrum A fighter aircraft reveals that a highly raked inlet (top of inlet slanted forward of bottom of inlet) extends below the wing leading edge extensions and that the fuselage forebody is raised well above the engine inlet capture area (see figure 1). [redacted] 25X1

Comment:

The Fulcrum A's raised fuselage forebody gives it a profile different from the profile in our most recent assessment. The high angle of rake of the inlet suggests that the Fulcrum A has a two-dimensional, rectangular inlet similar to those on the Soviet MiG-25 Foxbat and the US F-15 aircraft. A reassessment of the internal fuel capacity, range/radius/endurance, and aerodynamic performance of the Fulcrum A may be required, depending on the layout of the engine inlets and the fuselage underside. [redacted] 25X1 25X1

[redacted]

The Fulcrum A is a twin-engine fighter; consequently, it has either two separate engine inlet openings or one combined inlet opening that branches into two ducts (see configurations in figure 2). The configuration of the inlet openings affects the fuselage volume available for internal fuel storage. A dark area on the photograph, however, precludes a determination of the inlet opening configuration [redacted] 25X1

The dark area at the inlet location is approximately 1 meter deep by 2 meters wide and has an estimated area of 1.5 to 2.5 square meters. Our estimate of the required inlet capture area for the Fulcrum A is 0.8 to 1.3 square meters (for two engines--includes maximum estimated engine airflow and bleed airflow requirements). Therefore, the dark area most likely obscures two inlet openings separated by a fuselage tunnel (see

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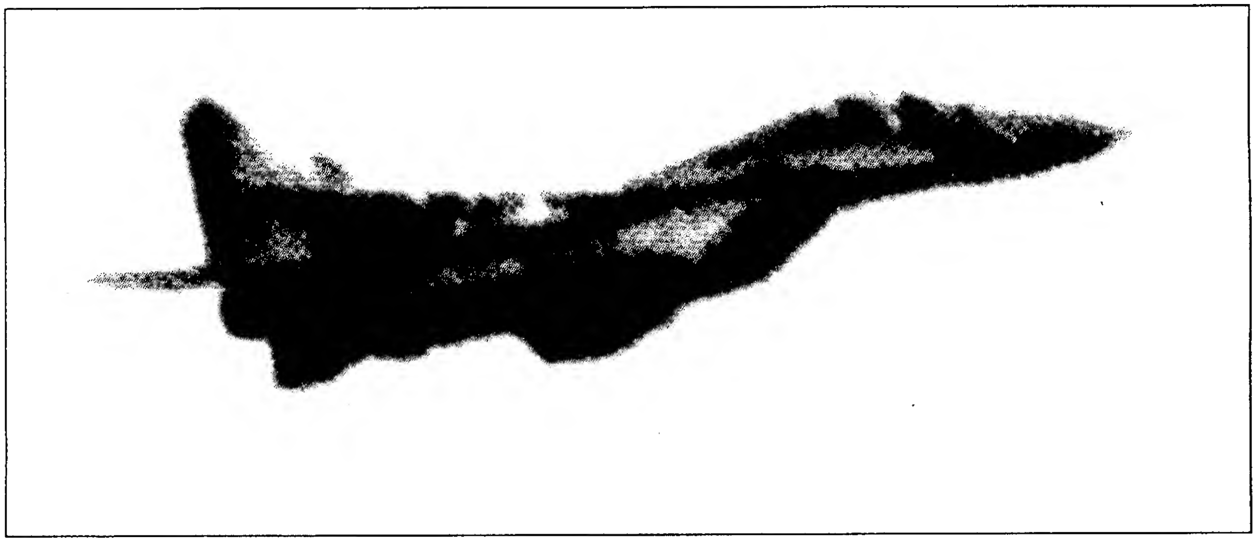
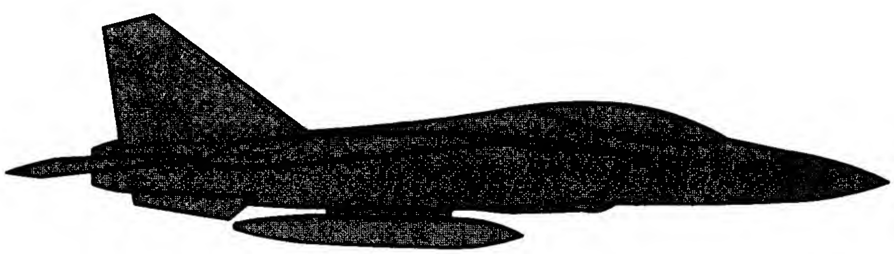
Figure 1
Comparison of New Profile View Photograph
With Previous Assessment of Fulcrum A



Drawing Based on Previous Assessment of Fulcrum A



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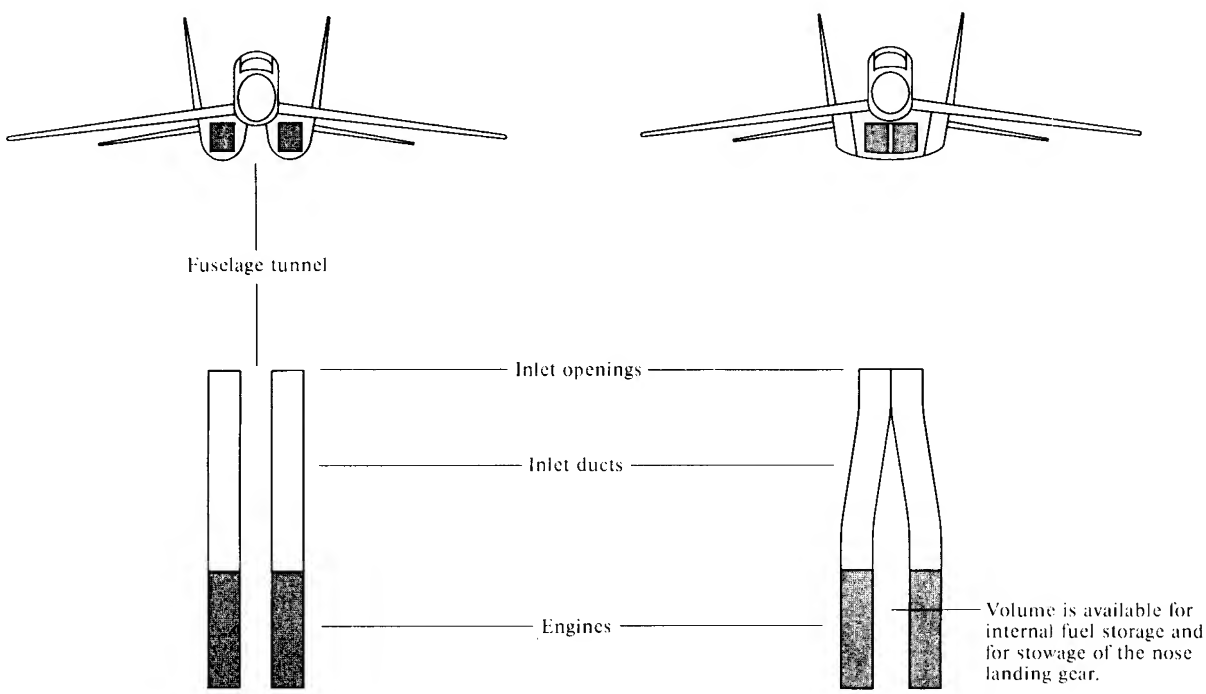
25X1

Figure 2
Possible Inlet Configurations

Configuration 1
Inlet openings: separated
Fuselage underside: tunnelled

Configuration 2
Inlet openings: combined
Fuselage underside: flat



25X1

12 FEBRUARY 1985
SW SWDR 85-026

25X1

configuration 1 in figure 2). If so, the tunnel would reduce the fuselage volume available for internal fuel storage. Consequently, we would have to use the low end of, or possibly reduce, our current 4,100- to 4,600-kilogram assessment of internal fuel capacity. If the internal fuel capacity of the Fulcrum A is less than 4,100 kilograms, our current assessments of its combat range/radius/endurance and clean takeoff weight would have to be reduced. The weight reduction would result in corresponding increases in thrust-to-weight ratio and maneuverability. 25X1

25X1

A less likely possibility is that the dark area obscures a combined inlet opening (see configuration 2 in figure 2). Such a configuration would provide additional fuselage volume for internal fuel storage and for stowage of the nose landing gear (the nose gear would have to be aft of the inlet openings in this configuration). Configuration 2 would require that we use the high end of, or possibly increase, our current assessment of the inlet capture area and propulsion system airflow requirements. The internal fuel capacity, combat range/radius/endurance, and clean takeoff weight probably would be close to our current assessments. 25X1

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USSR: ACADEMY OF SCIENCES SELECTS NEW MEMBERS 25X1

At the meeting on 26 December 1984 of the Soviet Academy of Sciences General Assembly, six scientists were elected academicians to fill vacancies within the Earth Sciences Section. The scientists elected were Nikolay Alekseyevich Logachev, Nikolay Nikitovich Puzyrev, Yuriy Mikhaylovich Pushcharovskiy, Yeygeniy Ivanovich Shemyakin, Grigoriy Aleksandrovich Avsyuk, and Kirill Yakovlevich Kondrat'yev. 25X1

Comment:

The selections reflect an increased emphasis on applied research and also highlight the importance of political and personal ties for career advancement. Election to the academy is intended to be the highest Soviet academic honor bestowed in recognition of scientific achievement. Although theoretical researchers have traditionally been favored, three of the six new members have been in administrative positions for many years and have never been recognized as prominent scientists. Their administrative responsibilities have focused on the development of Siberian resources, especially energy. Thus, their election appears to be in keeping with the decree in August 1983 by the Central Committee and Council of Ministers that the results of scientific research are to be relevant to the needs of the economy. 25X1

The value of personal connections is demonstrated by the fact that at least five of the six have ties with either Guriy Ivanovitch Marchuk, Chairman of the State Committee for Science and Technology, or Aleksandr Leonidovitch Yanshin, an academy vice president and head of the Earth Sciences Section.

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[redacted] 25X1

KEY JUDGMENTS: EVALUATION OF AN EAST GERMAN SEMICONDUCTOR MEMORY DEVICE [redacted]

The following is a summary of the Key Judgments from a recently published Reference Aid produced by the Office of Scientific and Weapons Research [redacted] 25X1 25X1

[redacted] 25X1

A recent evaluation [redacted] of an East German 16-Kbit, dynamic random-access memory device (DRAM), designated U256D, concluded that a West German mask set was probably used to produce the device. [redacted] 25X1 25X1

The U256D was fabricated using a silicon-gate, N-channel metal-oxide semiconductor (nMOS) process, which the evaluator described as "adequate." The device has double-layer polysilicon and top-level metal interconnections. A severe narrowing, or "dog-boning," effect was detected at the edges of the metal line. This effect usually is caused by overetching during the metallization etch step in the fabrication process. The U256D successfully passed electrical parametric and functional tests at 0- and 80-degrees Celsius for a memory device rated with an access time of 200 nanoseconds. [redacted] 25X1

The chip was encased in a plastic dual in-line package with a heat sink. A heat sink is an unusual feature in a microelectronic component that dissipates less than 1 watt. Manufacturers do not arbitrarily incur the additional cost of a heat sink without cause. We believe that the East Germans have experienced reliability problems with the U256D or its plastic package, which they have traced to poor thermal performance. The heat sink probably provides a greater power dissipation capability and more stable junction temperature when the device is exposed to higher than ambient temperatures. [redacted] 25X1 25X1